Air Resources Board

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MEMORANDUM

TO: Alan C. Lloyd, Ph.D.
Chairman

Honorable Board Members

FROM: Michael P. Kenny
Executive Officer

DATE: December 30, 2002

SUBJECT: UPDATE ON THE ARCHITECTURAL COATINGS SUGGESTED CONTROL MEASURE

The purpose of this memorandum is to provide an update to the members of the Air Resources Board (ARB/Board) on the current status of architectural coating activities.

As part of its approval of the Suggested Control Measure for Architectural Coatings (SCM) on June 22, 2000, the Board directed staff to provide them with two updates. The June 2001 report covered the availability of exempt solvents; the feasibility of modifying the calculation of reportable volatile organic compound (VOC) content; the feasibility of a small volume exemption; and an interim status report on evaluating the feasibility of a reactivity-based control strategy for architectural coatings. The second update requested by the Board is on the feasibility of a reactivity-based control strategy for architectural coatings, to be completed no later than December 2002. This update is to include the advantages and disadvantages of a reactivity-based control approach in comparison to a traditional mass-based VOC regulatory approach.

In this update, staff is documenting progress on a number of topics:

(1) districts adopting the SCM;
(2) averaging compliance option;
(3) 2001 architectural coatings survey;
(4) technology assessments for category limits effective on January 1, 2003; and
(5) assessment of feasibility of reactivity-based limits.

A more detailed report on each of these topics, including an update on the calculation of reportable VOC content and the availability of exempt solvents, is included in the enclosure.

Districts Adopting the SCM

To date, 16 districts have adopted or amended their architectural coating rules to reflect the language of the SCM. Eleven districts have amended their previous rules: Sacramento, San Joaquin Valley, Ventura, Santa Barbara, Bay Area, San Diego, Placer, Monterey, Butte, Colusa, and Feather River. Five districts have adopted an architectural coating rule for the first time: Yolo-Solano, San Luis Obispo, Northern Sonoma, Shasta and Tehama. In addition, the Glenn, Mojave, Antelope, Imperial, Kern, and El Dorado Districts are either working on, or are considering, adopting or amending an architectural coatings rule based on the SCM.

Districts encountered minimal opposition in adopting the SCM. The National Paint and Coatings Association (NPCA) forwarded, to a few districts, copies of previous comments challenging the technical feasibility of some of the limits. Districts also received comments on averaging and on phase-in periods for compliance with new limits. Districts addressed all comments without making major changes to the SCM.

ARB staff was involved in each district's rulemaking process by reviewing documents, attending workshops, helping address comments, and testifying at hearings. To date, no lawsuits have been filed against any district adopting the SCM.

The South Coast Air Quality Management District (SCAQMD) readopted, on December 6, 2002, the 1999 amendments to their architectural coatings rule. This action follows a California Court of Appeals decision ordering the SCAQMD to vacate the 1999 amendments based on procedural rather than technical issues. The SCAQMD appealed the decision to the California Supreme Court, but the request was denied.

Several states in the Ozone Transport Region, made up of the 13 eastern seaboard states from Virginia to Maine, are also in the process of adopting a rule based on the SCM. Delaware, the first state to adopt a rule, has been legally challenged by NPCA. The first legal step, an Environmental Appeals Board hearing, will be held in December 2002. ARB staff will provide expert testimony at this hearing.

Averaging Compliance Option

Averaging is a voluntary provision that sunsets on January 1, 2005, in local district architectural coatings rules based on the SCM. This provision allows manufacturers to average, on a volume-weighted basis, emissions of higher-VOC products with those of lower-VOC products, as long as the allowable emissions are not exceeded. Averaging provides manufacturers more flexibility to comply with VOC limits that have been

lowered by district rules based on the SCM. The SCAQMD rule has a similar averaging provision that does not sunset. The non-SCAQMD districts are participating in a statewide averaging program, managed by ARB staff, which allows manufacturers to submit only one averaging plan for all non-SCAQMD districts.

Last year, the Executive Officer issued a letter of clarification to the districts, specifying that the maximum VOC content (or ceiling) for products included in averaging would be the most common district limit in effect at the time the SCM was developed. The letter also included recommended language to allow higher-VOC products included in averaging to continue to be sold for three years after the sunset date, or until January 1, 2008. All district rules based on the SCM contain this language. Staff has worked with industry and the SCAQMD to develop an averaging guideline document which details what is required of manufacturers and how the averaging provision is enforced. Staff has also developed a Memorandum of Understanding between the ARB and the districts to formalize administrative and enforcement procedures. To date, only two statewide averaging programs have been received.

The United States Environmental Protection Agency (U.S. EPA) is currently evaluating several district rules submitted as revisions to the California State Implementation Plan. On September 20, 2002, the U.S. EPA published a proposed limited approval and limited disapproval for the San Joaquin Valley, Ventura, and Santa Barbara Districts' architectural coatings rules, based primarily on averaging issues. ARB staff disagrees with these stated deficiencies and, along with several districts and industry, provided comments to the U.S. EPA on the proposed disapprovals.

2001 Architectural Coatings Survey

To comply with provisions of State law requiring ARB to collect data on atmospheric emissions, the staff periodically surveys manufacturers of architectural coatings. The 2001 survey includes data from over 180 companies that sell products in California. Work on the survey has spanned almost two years, and staff has posted preliminary data on our web site for comments. Staff is also preparing a draft report which should be released in early 2003. This survey is the most rigorous that manufacturers have completed to date. The manufacturers submitted, under confidentiality agreements, a detailed listing of the volatile ingredients used in their products. The speciated VOC data will provide a baseline for evaluating a reactivity-based control strategy.

Technology Assessments

As part of its approval of the 2000 SCM, the Board resolution directed ARB staff to: monitor the progress of manufacturers in meeting the SCM limits; conduct technology

assessments prior to the effective dates for categories with limits that are lowering in 2003 and 2004; and propose any future modifications to the SCM that might be appropriate.

The 2001 survey data (2000 sales) formed the primary basis for this 2002 technology assessment. In addition, data from SCAQMD-sponsored performance tests by National Technical Systems (NTS) and KTA-Tator, and SCAQMD's annual technology assessments were considered. We considered differences in complying marketshares for interior versus exterior products (where applicable), and whether the limits were deleterious to small business. Staff also considered whether the categories were included in the averaging programs received to date. Staff found that all of the limits are technically feasible with no significant adverse effects on small business. This finding is confirmed by the fact that SCAQMD, which has already implemented these limits, has received no variance requests. Because the 250 grams of VOC per liter of coating (g/l) limit for industrial maintenance coatings does not become effective until January 1, 2004, we are not reporting on progress in meeting the industrial maintenance limit.

The following table summarizes the survey data that form the basis of the technology assessments. More information about each category is found in the Enclosure.

Category	VOC Limit, g/l	Sales-Weighted Average VOC, g/l	% Complying Marketshare
Flats	100	97	73
Lacquers	550	565	31
Multicolor Coatings	250	221	78
Nonflats (excluding high gloss)	150	168	46
Primers, Sealers, and Undercoaters	200	150	82
Quick Dry Enamels	250	358	12
Quick Dry Primers, Sealers, and Undercoaters	200	365	22
Stains	250	265	39
Swimming Pool Repair and Maintenance Coatings[1]	340	276	93
Waterproofing Sealers	250	250	40

[1]The compliant products reported here are from the swimming pool coatings category.

Feasibility of Reactivity-Based Limits

The ARB has funded many research projects to further the scientific knowledge of photochemical reactivity. Traditionally, environmental chamber experiments have been used to predict ozone impacts of individual VOCs. However, the smaller chambers

used to date have limitations on the variety of environmental conditions that can be tested. In addition, low volatility VOCs are difficult to test in small chambers because they tend to stick to the chamber walls. Under U.S. EPA funding, Dr. William P. L. Carter has developed a large, "next generation" environmental chamber facility at the University of California, Riverside, that will allow experiments to be conducted under more varied environmental conditions. The Board recently funded a $300,000 architectural coatings research contract with Dr. Carter, due to be completed in early 2005, with the objectives described below.

Petroleum distillates, or mineral spirits, are key ingredients in solvent-borne architectural coatings. There are dozens of different blends of these petroleum by-products from a variety of manufacturers, with wide variations in chemical composition and properties. Dr. Carter will attempt to characterize the reactivity of several of these distillate mixtures. The ARB, in consultation with the Reactivity Research Advisory Committee (RRAC), will choose four to five distillates that Dr. Carter will test in the next generation environmental chamber. Some of these distillates will be chosen by the end of this year, based on RRAC members' recommendations. The remainder will be chosen after the 2001 survey ingredient data are finalized in early 2003.

Another key ingredient used in water-borne coatings is Texanol® (Eastman Chemical), a coalescing solvent that helps the resin form a film. Texanol® is considered a low-volatility compound. One of Dr. Carter's objectives is to use the next generation chamber to analyze the photochemical reactivity of Texanol®.

Finally, in an earlier ARB contract, Dr. Carter worked on a low-cost "direct reactivity" approach in which a chamber is not used. Under the direct reactivity approach, the VOC is irradiated with nitrous acid and the reaction products are measured to estimate the VOC's photochemical reactivity. Dr. Carter will use some of the $300,000 research funding to further develop the "direct reactivity" method. If successful, this system might be a low-cost alternative to conducting chamber experiments.

There are many advantages to developing a reactivity-based control strategy for architectural coatings. Architectural coatings are a well-defined emissions source, with adequate sales information and ingredient speciation to determine the reactivity of individual products. The reactivities of many VOCs in architectural coatings are well known, and research is under way to fill gaps in our knowledge. Because architectural coatings are already more than 80 percent water-borne, mass-based emission reductions are becoming more difficult, and reactivity-based limits offer a new opportunity to achieve ozone benefits. We expect the air quality benefit of a

reactivity-based control strategy to be equal or greater than that of a mass-based strategy, because VOCs with the greatest ozone forming potential will be targeted rather than treating each VOC equally.

There are also disadvantages to a reactivity-based control strategy for architectural coatings. Architectural coatings are regulated by districts, and a substantial resource commitment by the ARB may be required to help districts implement a more complex reactivity-based regulation. Because most coatings are water-borne, and solvent-borne coatings containing primarily low reactive mineral spirits, there may be limited potential to reduce ozone with lower-reactive solvents. Any reactivity-based strategy would evaluate the potential uses of toxic compounds. Because toxic compounds may have a potential increased use due to their low reactivity, we may need to cap current uses and potentially ban new uses of such compounds.

As discussed above, the ARB is currently sponsoring research to improve the reactivity estimates for VOCs used extensively in architectural coatings. The research is scheduled to be completed in 2005. At that time, we will assess the feasibility of developing a reactivity-based SCM.

If you have any questions, please contact me at (916) 445-4383, or
Mr. Peter D. Venturini, Chief, Stationary Source Division, at (916) 445-0650.

Enclosure

cc: Mr. Peter D. Venturini, Chief
Stationary Source Division